Code for Lifting Appliances in a Marine Environment, August 2009

Notice No. 3

Effective Date of Latest Amendments:

See page 1

Issue date: May 2011

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CODE FOR
LIFTING APPLIANCES
IN A MARINE ENVIRONMENT,
August 2009

Notice No. 3

This Notice contains amendments within the following Sections of the *Code for Lifting Appliances in a Marine Environment, August 2009.* The amendments are effective on the dates shown:

Chapter	***Section***	***Effective date***
3	2, 3	1 June 2011
5	2, 3	1 June 2011

The *Code for Lifting Appliances in a Marine Environment, August 2009* is to be read in conjunction with this Notice No. 3. The status of the Rules is now:

Code for Lifting Appliances in a Marine Environment	Effective date:	August 2009
Notice No. 1	Effective dates:	1 March 2010 & Corrigenda
Notice No. 2	Effective dates:	1 July 2011
Notice No. 3	Effective dates:	1 June 2011

Chapter 3

Cranes and Submersible Lifting Appliances

Effective date 1 June 2011

■ *Section 2*
Shipboard cranes

2.25 Slewing ring and slewing ring bolting

2.25.6 The slewing rings are to comply with the Charpy V-notch impact test requirements as per Ch 3,2.26.4, as applicable.

2.26 Materials

2.26.2 The selected steel grade is to provide adequate assurance against brittle fracture taking into account the material tensile strength and thickness and the environment in which the crane is designed to operate, *see* Chapter 8, and is in general, to comply with the Charpy V-notch impact test requirements given in ~~Table 3.2.17~~ Tables 3.2.17 to 3.2.19.

~~Table 3.2.17 Charpy V-notch test requirements~~

Thickness, in mm	Charpy test temperature, in °C	Maximum tensile strength, in N/mm^2		
		540	590	630
$t \leq 20$	Room temperature*	27	31	34
$20 < t \leq 30$	0	27	31	34
$30 < t \leq 40$	–10	27	31	34
$40 < t \leq 50$	–20	27	31	34
$50 < t \leq 130$	–40	27	31	34

NOTE
*Charpy impact test is not required provided the carbon content is not greater than 0,23 per cent and the manganese content is not less than 2,5 times the carbon content.

Table 3.2.17 Charpy V-notch impact test temperature requirements for welded primary and secondary steel structure. Excludes stainless steel

	Minimum design temperature							
	–10°C, *see* Notes		–20°C		–30°C		–40°C	
	Required impact test temperature							
Thickness, mm	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
$t \leq 10$	0°C *see* Note 2	+20°C *see* Note 2	0°C	+20°C *see* Note 2	–20°C	–20°C	–20°C	–20°C
$10 < t \leq 20$	0°C *see* Note 2	+20°C *see* Note 2	–20°C	0°C	–20°C	–20°C	–40°C	–20°C
$20 < t \leq 25$	0°C	0°C *see* Note 2	–20°C	0°C	–40°C	–20°C	–40°C	–20°C
$25 < t \leq 30$	–20°C	0°C	–40°C	–20°C	–40°C	–20°C	–40°C	–40°C
$30 < t \leq 40$	–20°C	0°C	–40°C	–20°C	–40°C	–20°C	–60°C	–40°C
$40< t \leq 50$	–20°C	0°C	–40°C	–20°C	–60°C	–20°C	–60°C	–40°C
$50< t \leq 60$	–40°C	–20°C	–60°C *see* Note 3	–20°C	–60°C	–40°C	–60°C	–40°C
$60 < t \leq 150$	–40°C	–20°C	–60°C *see* Note 3	–20°C	–60°C	–40°C	–60°C	–40°C

NOTES
1. Worldwide service refers to minimum design temperature –10°C or above.
2. For carbon steels up to minimum specified yield strength of 235 N/mm^2 impact testing is not required unless the carbon content is above 0,23% and/or manganese content is below 2,5 x carbon content, in which case impact tests are to be carried out at +20°C.
3. For carbon and carbon manganese steels with a minimum specified yield strength of 355 N/mm^2 or below, the test temperature need not be taken lower than –40°C for plates delivered in the normalised condition only.

Table 3.2.18 Charpy V-notch impact test temperature requirements for non-welded (rolled, cast and forged) components (excluding slew bearings) subject to tensile loading. Excludes stainless steels

	Minimum design temperature							
	–10°C, *see* Note 1		–20°C		–30°C		–40°C	
	Required impact test temperature							
Thickness, mm	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
t ≤ 10	+20°C *see* Note 2	NR	+20°C *see* Note 2	+20°C *see* Note 2	–20°C	0°C	–20°C	0°C
10 < *t* ≤ 20	+20°C *see* Note 2	NR	0°C	+20°C *see* Note 2	–20°C	0°C	–40°C	–20°C
20 < *t* ≤ 25	+20°C *see* Note 2	NR	0°C	+20°C *see* Note 2	–20°C	0°C	–40°C	–20°C
25 < *t* ≤ 30	0°C	+20°C *see* Note 2	–20°C	0°C	–20°C	0°C	–40°C	–20°C
30 < *t* ≤ 40	0°C	+20°C *see* Note 2	–20°C	0°C	–20°C	0°C	–40°C	–20°C
40< *t* ≤ 50	0°C	+20°C *see* Note 2	–20°C	0°C	–20°C	0°C	–40°C	–20°C
50< *t* ≤ 100	–20°C	0°C	–20°C	–20°C	–40°C	–20°C	–40°C	–40°C
100 < *t* ≤ 150	–20°C	0°C	–40°C	–20°C	–40°C	–40°C	–40°C	–40°C

NOTES
1. Worldwide service refers to minimum design temperature -10°C or above.
2. For carbon steels up to minimum specified yield strength of 235 N/mm^2 impact testing is not required unless the carbon content is above 0,23% and/or manganese content is below 2,5 x carbon content, in which case impact tests are to be carried out at +20°C.

Table 3.2.19 Charpy V-notch test impact energy requirements for classed and certified lifting appliances

Minimum specified yield stress (N/mm^2)	Minimum average impact energy (J)	Sampling direction
235	27	*L*
275	31	*L*
355	34	*L*
460	40	*L*
690	40	*L*

~~*2.26.3* Special consideration will be given to proposals to use materials which do not meet the requirements of Table 3.2.17 where it can be shown that satisfactory service experience has resulted from the particular materials and construction.~~

2.26.3 For the applications shown below, slew bearings are to be forged materials and shall be delivered in the quenched and tempered condition. Materials typically used for slew bearing applications are 34CrNiMo6 or 42CrMo4 or equivalents. Where other material grades or manufacturing processes are proposed, special consideration will be required.

2.26.4 For worldwide ship operation slew bearings are to be subject to a Charpy V-notch impact test at room temperature, the minimum average test requirement is 34 J. For ship operations below –10°C the Charpy V-notch impact test minimum average requirement is 42 J at a test temperature of –20°C.

2.26.5 For offshore installations, slew bearings require Charpy V-notch impact tests to be carried out at –20ºC and achieve a minimum average energy of 42 J.

■ *Section 3*
Offshore cranes

3.6 Slew rings

~~*3.6.1* Slew rings for offshore cranes are to be constructed of steel having an average Charpy V-notch impact value at minus 20°C of 42 J taken from three samples with a lowest single value not less than 27 J. Steel having lower values to ensure adequate bearing properties and where the design is such as to minimise notch effect will be specially considered.~~

3.6.1 The slewing rings are to comply with the Charpy V-notch test requirements as per Ch 3,2.26.5.

3.6.6 The slewing ring bolts are to be made from steel having impact properties as given in ~~3.6.1~~ 2.26.5 and where necessary the threads may be rolled after heat treatment to improve fatigue strength. In general, the steel grade is not to exceed ISO 898/1 Grade 10.9.

3.6.8 In addition to the above design requirements, the slew ring is to be manufactured under survey and LR's Surveyor will be required to witness the following aspects of the inspection procedure during its manufacture:

(a) Testing of samples from the actual slew ring forging to ensure that the requirements of ~~3.6.1~~ Ch 3,2.26.3, 2.26.5 and 3.6.2 are complied with.
(b) Type testing of the slew ring to determine the static and fatigue strengths as required by 3.6.3.
(c) Magnetic particle examination of the machine finished components of the ring to ensure that they are free from cracks, etc.

3.7 Materials

3.7.2 The selected steel grade is to provide adequate assurance against brittle fracture ~~and is to be suitable for a design operating temperature of –10°C~~. Account is to be taken of the material tensile strength, thickness and the environment in which the crane is designed to operate, *see* Chapter 8.

3.7.3 The steel for primary and secondary structural members is to comply with the Charpy V-notch impact test requirements given in ~~Table 3.3.2. The test temperature is specified in relation to the material thickness and the energy value according to the actual tensile strength~~ Ch 3,2.26.

3.7.4 For design operating temperatures below ~~–10°C~~ –40°C the Charpy V-notch impact test requirements will be specially considered.

~~**Table 3.3.2 Charpy V-notch test requirements**~~

~~Thickness, in mm~~		~~Charpy test temperature, in °C~~	~~Actual maximum tensile strength~~		
~~Primary structure~~	~~Secondary structure~~		~~540~~	~~590~~	~~630~~
			~~Charpy V-notch energy, in J~~		
~~*t* ≤ 10~~	~~*t* ≤ 20~~	~~Room temperature*~~	~~27~~	~~31~~	~~34~~
~~10 < *t* ≤ 15~~	~~20 < *t* ≤ 30~~	~~0~~	~~27~~	~~31~~	~~34~~
~~15 < *t* ≤ 20~~	~~30 < *t* ≤ 40~~	~~–10~~	~~27~~	~~31~~	~~34~~
~~20 < *t* ≤ 25~~	~~40 < *t* ≤ 50~~	~~–20~~	~~27~~	~~31~~	~~34~~
~~25 < *t* ≤ 60~~	~~50 < *t* ≤ 60~~	~~–40~~	~~27~~	~~31~~	~~34~~

~~NOTE~~
~~* Test may be omitted provided carbon content is not greater than 0,23 per cent and the manganese content is not less than 2,5 times the carbon content.~~

Chapter 5

Lifts and Ramps

Effective date 1 June 2011

■ *Section 2*
Cargo and vehicle lifts

2.14 Materials

2.14.3 Where the lift is subject to certification only, the material is to comply with Ch 8,2. The selected steel grade is to provide adequate assurance against brittle fracture taking into account the material tensile strength and thickness and the environment in which the lift is designed to operate and, in general, is to comply with the Charpy V-notch impact test requirements given in ~~Table 3.2.17~~ Tables 3.2.17 to 3.2.19 in Chapter 3.

■ *Section 3*
Vehicle ramps

3.10 Materials

3.10.3 Where the ramp is subject to certification, the material is to comply with Ch 8,1.2. The selected steel grade is to provide adequate assurance against brittle fracture taking into account the material tensile strength and thickness and the environment in which the ramp is designed to operate and, in general, is to comply with Charpy V-notch impact test requirements given in ~~Table 3.2.17~~ Tables 3.2.17 to 3.2.19 in Chapter 3.

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